

DOCKETED

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Streamlining ASHRAE Guideline 36 adoption in California

Additional submitted attachment is included below.



Electric Program Investment Charge 2026–2030 (EPIC 5) Research Concept Proposal Form

The California Energy Commission (CEC) is currently soliciting research concept ideas and other input for the Electric Program Investment Charge 2026–2030 (EPIC 5) Investment Plan. For those who would like to submit an idea for consideration, please complete this form and submit it to the CEC by **August 8, 2025**. More information about EPIC 5 is available below.

To submit the form, please visit the e-commenting link:
<https://efiling.energy.ca.gov/EComment/ECommentSelectProceeding.aspx> and select the Docket **25-EPIC-01**. Enter your contact information and then use the “choose file” button at the bottom of the page to upload and submit the completed form. Thank you in advance for your input.

1. *Please provide the name, email, and phone number of the best person to contact should the CEC have additional questions regarding the research concept:*

Marc Fountain, mfountain@trccompanies.com, 510-672-3828

2. *Please provide the name of the contact person’s organization or affiliation:*

TRC

3. *Please provide a brief description of the proposed concept that you would like the CEC to consider as part of the EPIC 5 Investment Plan. What is the purpose of the concept, and what would it seek to do? Why are EPIC funds needed to support the concept?*

Streamlining ASHRAE Guideline 36 adoption in California

ASHRAE Guideline 36, High-Performance Sequences of Operation for HVAC Systems (G36) provides detailed instructions for how to control HVAC systems efficiently. Created for new construction projects, G36 is also applicable to the 80% of the current California building stock that will remain in 2050. Although applying G36 strategies offers significant potential for cost effective energy savings and significant decarbonization, widespread G36 adoption has encountered challenging technical and market obstacles. Previous studies and small-scale G36 deployments have identified specific obstacles and successfully offered piecemeal

solutions - achieving savings more often than not. The need is for a comprehensive pattern book or 'design, commissioning, and deployment' guide that brings together best practices, common obstacles and solutions, and success criteria with real world system performance and cost effectiveness data.

Projects meeting the challenge posed by this concept area will offer ways for G36 implementers: design engineers, commissioning contractors, and building systems managers to overcome market barriers and achieve successful G36 implementations. It is anticipated that the research will include many of the following activities:

- 1) Developing a building G36 readiness assessment rubric
- 2) Validation of cost effectiveness approaches and tools
- 3) Creating a framework for simplification and sorting of G36 algorithms where needed for G36 deployment in buildings with suboptimal controls infrastructure
- 4) Extension of case study library to include more building types and more climate zones. Deploy, collect data, analyze results, document processes, and catalog obstacles and solutions
- 5) Establishment of a central, publicly accessible G36 database with building demographics, key performance data, and cost effectiveness metrics
- 6) Market penetration, technology transfer and adoption, and scalability plan
- 7) Positioning and planning for incentive program design
- 8) Workforce education and training
- 9) End-to-end streamlining of activities 1 through 8 above
- 10) Development of a pattern book or 'design, commissioning, and deployment' guide for G36 implementers

4. *In accordance with Senate Bill 96, please describe how the proposed concept will "lead to technological advancement and breakthroughs to overcome barriers that prevent the achievement of the state's statutory energy goals." For example, what technical and/or market barriers or customer pain points would the proposed concept address that would lead to increased adoption of clean energy technology or innovation? Where possible, please provide specific cost and performance targets that need to be met for increased industry and consumer acceptance. For scientific analysis and tools, provide more information on what data and information gaps the proposed concept would help fill, and which specific parties or end users would benefit from the results, and for what purpose(s)?*

Projects fulfilling the goals of this research concept will address key technology adoption barriers and pain points by providing ways to answer some of the following questions:

- 1) How do I know if my building is ready for G36 implementation?
 - a. If it's not, why not?
 - 2) How do I figure out if G36 deployment will be cost-effective in my building?
 - 3) If only some of the G36 controls optimizations are suitable for my building, what subset can I implement?
 - 4) I am not an early adopter. Where and in what types of buildings have successful G36 deployments occurred?
 - a. What were the performance improvements?
 - b. How much energy was saved?
 - c. How much money was saved?
 - d. When a G36 implementation did not result in a positive outcome, what happened?
 - e. How can I mitigate the risk of negative outcomes: loss of time, loss of money, occupant disruption and dissatisfaction, for example?
 - 5) Where can I find real world data from G36 deployments in other buildings?
 - a. Where can I input demographic data about my building and compare it to other buildings?
 - b. How can I figure out which parts of G36 are critical for positive outcomes and which parts are less important?
 - 6) Where can I find a guide that explains how to implement G36, describes the problems I may encounter, offers solutions, and shows me how to mitigate the risk of poor outcomes?
5. *Please describe the anticipated outcomes if this research concept is successful, either fully or partially. For example, to what extent would the research reduce technology or ratepayer costs and/or increase performance to improve the overall value proposition of the technology? What is the potential of the innovation at scale? How will the innovation lead to ratepayer benefits in alignment with EPIC's guiding principles to improve safety,ⁱⁱ reliability,ⁱⁱⁱ affordability,^{iv} environmental sustainability,^v and equity?^{vi}*

Anticipated outcomes include wider adoption of ASHRAE Guideline 36 in California. From Cheng et. al. below, "The estimated statewide potential benefits of implementing Guideline 36 and networked lighting controls in existing commercial buildings in California over the next 15 years include reducing electricity use by 2,387 gigawatt hours, which will save

Californians \$373 million in energy costs and eliminate 1,742 million pounds of carbon dioxide emissions.”

6. *Describe what quantitative or qualitative metrics or indicators would be used to evaluate the impacts of the proposed research concept.*

Shortened Guideline 36 implementation times
Operational performance improvements
Energy saved
Cost saved

7. *Please provide references to any information provided in the form that supports the research concept’s merits. This can include references to cost targets, technical potential, market barriers, equity benefits, etc.*

ASHRAE [Guideline 36-2024 -- High-Performance Sequences of Operation for HVAC Systems \(Includes Supporting Files\) | ASHRAE Store](#)

Performance improvements and payback times
[Cheng, Hwakong, Rupam Singla, and Gwelen Paliaga. 2021. Demonstrating Scalable Operational Efficiency through Optimized Controls Sequences and Plug-and-Play Solutions. California Energy Commission. Publication Number: CEC-500-2022-017.](#)

[CEC Best in Class - Project Brief.pdf](#)

8. *The EPIC 5 Investment Plan must support at least one of five Strategic Goals:^{vii}*
- a. Transportation Electrification*
 - b. Distributed Energy Resource Integration*
 - c. Building Decarbonization*
 - d. Achieving 100 Percent Net-Zero Carbon Emissions and the Coordinated Role of Gas*
 - e. Climate Adaptation*

Please describe in as much detail as possible how your proposed concept would support these goals.

This project supports the EPIC-5 goal of Building Decarbonization by enabling wider deployment of ASHRAE Guideline 36, High-Performance Sequences of Operation for HVAC Systems. (G36) provides detailed instructions for how to control HVAC systems efficiently. Increased HVAC system efficiency results in building decarbonization through lower energy use.

About EPIC

The CEC is one of four EPIC administrators, funding research, development, and demonstrations of clean energy technologies and approaches that will benefit electricity ratepayers of California's three largest investor-owned electric utilities.

EPIC is funded by California utility customers under the auspices of the California Public Utilities Commission.

To learn more about EPIC, visit: <https://www.energy.ca.gov/programs-and-topics/programs/electric-program-investment-charge-epic-program>

EPIC 5 documents and event notices will be posted to:
<https://www.energy.ca.gov/proceeding/electric-program-investment-charge-2026-2030-investment-plan-epic-5>

Subscribe to the EPIC mailing list to stay informed about future opportunities to inform the development of EPIC 5:

<https://public.govdelivery.com/accounts/CNRA/signup/31897>

i See section (a) (1) of Public Resources Code 25711.5 at:

https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=PRC§ionNum=25711.5.

ii EPIC innovations should improve the safety of operation of California's electric system in the face of climate change, wildfire, and emerging challenges.

iii EPIC innovations should increase the reliability of California's electric system while continuing to decarbonize California's electric power supply.

iv EPIC innovations should fund electric sector technologies and approaches that lower California electric rates and ratepayer costs and help enable the equitable adoption of clean energy technologies.

v EPIC innovations should continue to reduce greenhouse house gas emissions, criteria pollutant emissions, and the overall environmental impacts of California's electric system, including land and water use.

vi EPIC innovations should increasingly support, benefit, and engage disadvantaged vulnerable California communities (DVC). (D.20-08-046, Ordering Paragraph 1.) DVCs consist of communities in the 25 percent highest scoring census tracts according to the most recent version of the California Communities Environmental Health Screening Tool (CalEnviroScreen), as well as all California tribal lands, census tracts with median household incomes less than 60 percent of state median income, and census tracts that score in the highest 5 percent of Pollution Burden within CalEnviroScreen, but do not receive an overall CalEnviroScreen score due to unreliable public health and socioeconomic data.

vii In 2024 the CPUC adopted five Strategic Goals to guide development of the EPIC 5 Investment Plan. A description of the goals can be seen in Appendix A of CPUC Decision 24-03-007 available at:

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M527/K228/527228647.PDF>